Civilization and modern medicine now allow an unprecedented number of people to survive to old age. Not only has the definition of “old” evolved, but the aims of medical care for the elderly have progressed far beyond survival to maximizing functional and cognitive status, improving quality of life, and preserving productivity.

Although many health problems in older age can be prevented or postponed by medical interventions, the quality of medical care for older persons remains largely unexamined. Previous work on quality-of-care measurement has focused on specific diseases or aspects of care, and in some cases targeted only a slice of the older population (1–6). Such targeted approaches may not present a fair picture of overall quality and may lead to unintended incentives (“gaming the system”) (7). Although broad systems of quality-of-care evaluation are less susceptible to “gaming,” they seldom include quality indicators focused on aspects of care important to older sick persons (8, 9).

Substantial variation in preferences may make quality of care for older adults particularly difficult to measure. For example, older adults do not consistently prefer care that prolongs life, particularly if this care occurs at the expense of comfort. Furthermore, many ill, older adults cannot advocate for themselves and may have no family members or friends to do so on their behalf. Thus, objective measures of the care they receive are particularly important.

The Assessing Care of Vulnerable Elders (ACOVE) project endeavored to develop a comprehensive set of quality-assessment tools for ill older persons. Because “ill older persons” constitute a heterogeneous cohort that is not easily delineated, we created a system to identify high-risk, community-dwelling individuals and targeted the most important clinical conditions affecting them. Specifically, our goals for this project were the following:

1. Develop a definition of “vulnerable elders” that delineates a group of community-living persons 65 years of age and older who are at high risk for death or functional decline, and develop a system to identify them.
2. Identify important medical conditions that affect vulnerable elders and for which effective methods of prevention or management exist.
3. Develop a set of evidence-based, quality-of-care indicators that are relevant to vulnerable elders using systematic literature reviews, expert opinion, and the guidance of expert groups and stakeholders.
4. Design a chart abstraction tool, interview instrument, and administrative data analytic methods to implement the quality-of-care indicator system.

**PROJECT STRUCTURE: ADVISORY BOARDS**

To make the ACOVE tools as clinically useful as possible and to enhance their value to those who may use them, two advisory committees oversaw the project. The Clinical Committee directed the definition of the
target population and identified the target conditions. It also reviewed the full set of quality indicators assembled by the expert panels (see the Methods paper on pp 647-652).

The Policy Advisory Committee directed the structure of the quality indicator system and the measurement approach. This committee reviewed the sampling system, considered the value of a community survey–based sample versus a sample drawn from administrative data, advised the project on methods of data collection, and advocated the use of process measures rather than outcomes.

The Appendix lists the members and institutional affiliations of the Clinical Committee and the Policy Advisory Committee and ACOVE investigators and staff.

**DEFINITION AND SELECTION OF THE PATIENT SAMPLE**

We termed our target sample “vulnerable elders.” With the assistance of the Clinical Committee, we defined “vulnerable elders” as persons 65 years of age and older who are at increased risk for death or functional decline.

We considered several methods of identifying a community-based sample for measurement, including use of administrative data and survey sampling. The Policy Advisory Committee advised against using a sampling method based solely on administrative data because, by definition, using utilization data to define health status and disease burden disproportionately samples persons with higher utilization of health services and may not identify persons who are undertreated or underdiagnosed. We selected a survey method that would identify vulnerable elders regardless of the amount of health care they used and that would be versatile for use across venues and health insurance systems.

Using the Medicare Current Beneficiary Survey, we determined that functional status is a more important predictor of death and functional decline than are specific clinical conditions. A parsimonious set of factors that could be asked about in a brief interview, including age, self-rated health, and functional disabilities and limitations, predicted functional decline and death. Using these factors, we developed a scoring system that identified 32% of a nationally representative sample as vulnerable: This group had more than four times the risk for death or functional decline over a 2-year period compared to the lower-scoring majority of the sample (10). When we applied this definition to a random sample of persons 65 years of age and older enrolled in managed care plans, 21% of elders were classified as vulnerable.

**TARGET CONDITIONS FOR ASSESSING QUALITY OF CARE**

We selected the target conditions for quality-of-care assessment using literature reviews and a formal group-judgment process. Target conditions were conceptualized as prevalent, important to health status and quality of life, having outcomes affected by medical care, feasible to measure, and “geriatric.” The Clinical Committee used these criteria to select 21 diseases, geriatric syndromes, physiologic impairments, and clinical situations (see the Methods article, pp 647-652, for a list of these 21 conditions). The Policy Advisory Committee added a 22nd condition, continuity and coordination of care.

According to national survey estimates, the prevalence of the selected conditions ranged from 10% to 50% among community-dwelling elders. These conditions accounted for at least 43% of acute hospital admissions and 33% of office visits for persons 65 years of age and older. The process of selecting the conditions is discussed in detail elsewhere (11).

**DEVELOPING QUALITY-OF-CARE INDICATORS FOR VULNERABLE ELDERS**

Clinical experts developed potential quality indicators for each target condition using existing guidelines and clinical opinion. Indicators covered the domains of prevention, diagnosis, treatment, and follow-up. Structured literature reviews were then performed to assess the evidence supporting a link between the proposed processes of care and improved outcomes in older adults. We subsequently presented the proposed quality indicators and the literature syntheses to panels of experts in geriatric care and medical specialists. These expert panels considered the indicators’ validity and feasibility. On the basis of the panels’ ratings and a comprehensive review of the set by the Clinical Committee, we developed a set of 236 quality indicators covering the 22 conditions. The Methods article (pp 647-652) describes this process in detail. This set of indicators was reviewed and modified by the American College of Physicians–American Society of Internal Medicine (ACP–ASIM) Task Force on Aging. The full
set of quality indicators with the literature substantiation for 11 of the conditions constitute the remainder of this supplement. The papers containing the literature reviews for the other 11 conditions are available, with consolidated ACOVE materials, on the Task Force on Aging page on the ACP–ASIM Web site (www.acponline.org/sci-policy/).

A review of the accepted quality indicators reveals their decidedly “geriatric” nature. Many of them focus on the transfer of information between the health care provider and the patient or patient’s proxy. In addition to disease management, the indicators pay attention to detecting classically underidentified conditions, such as depression, dementia, and functional impairment. Consideration of “proportionate” care, informed consent, and end-of-life issues permeates the set.

**IMPLEMENTING THE QUALITY INDICATORS**

We developed instruments to implement the quality indicators using information collected from three sources: the medical record, a patient (or, if necessary, proxy) interview, and administrative data. Medical records include all inpatient and outpatient care over a 1-year period. The interview is designed to be conducted by telephone with the patient to identify aspects of care that are not well captured in the medical record. The quality indicators presented here are currently undergoing feasibility testing in two managed care plans.

Scoring the quality indicators accounts for clinical circumstances, patient preferences, and patient prognosis. The scoring of each quality indicator accounts for these factors at the following five levels:

1. Any chart documentation indicating that a care process does not apply to the patient excludes application of this indicator to the patient.

2. Any care process that is contraindicated because of comorbidity, allergy, or intolerance (such as contraindications to medication) excludes application of the indicator to the patient.

3. If an indicator states that a care process should be “offered” to a patient, this indicator is satisfied if the care process occurs, if the medical record (or patient interview) indicates that the patient rejected the care process, or if the medical record (or patient interview) documents that the care process was offered to the patient.

4. If the medical record contains documentation or if during an interview a patient states that he or she would not want, under any circumstances, to be hospitalized, then the 11 indicators that would require hospitalization do not apply. Similarly, a preference not to accept surgery would exclude from application to that patient the 9 indicators that prescribe surgery or procedures that would lead to surgery.

5. If a patient has advanced dementia or a chart-documented poor prognosis (expected survival <6 months), then specific indicators will not be applied to the measurement of quality for that patient. The ACOVE Clinical Committee explicitly considered these conditions in light of all ACOVE indicators and excluded 34% of the indicators from application to patients with poor prognosis and 40% from application to patients with advanced dementia (12).

The quality indicators presented in this supplement require implementation for local use, depending on local guidelines and resource issues. For example, one of the ACOVE indicators for dementia (indicator 11) requires patients with newly diagnosed dementia to be referred to an appropriate agency to determine whether these patients can drive safely. This indicator might be operationalized differently in different geographic regions depending on which agencies can perform this function in that region. Similarly, many of the indicators require that a therapeutic intervention be performed for specific populations but do not specify the intervention. What a satisfactory “intervention” is may vary depending on local guidelines, clinical pathways, and resource issues; therefore, it is left to local groups to define.

As noted above, ACOVE implemented this indicator set using data elements derived from a 1-year medical record (outpatient, inpatient, nursing home, mental health, and transition care), an interview with the vulnerable elder (or proxy, if appropriate), and analysis of administrative data. We developed specific definitions concerning the triggering and satisfaction of the indicators using each of these data sources. (Not all indicators can be assessed by each of these techniques.)

**USES OF THE QUALITY INDICATORS**

Two important issues about the quality indicators set forth in this report are important to note. First, quality indicators are not the same as practice guidelines. Quality indicators typically set a standard that if not met almost certainly identifies poor-quality care. Practice guidelines, in contrast, strive to define optimal care in
the context of complex medical decision making. Second, these indicators are designed to measure care at the level of the health system or health plan. No individual physician could be responsible for performing all of the processes indicated across all the ACOVE indicators.

The ACOVE project is designed to produce an aggregate score that measures quality at the health system or plan level. To do so, examining the care of approximately 200 patients is sufficient to detect meaningful differences in aggregate quality between health systems or plans, assuming that, on average, patients trigger 20 indicators each. Detecting statistically valid, meaningful differences at lower levels of aggregation, such as individual conditions (for example, a diabetes quality score and a dementia quality score), will require examining the care of more patients (to have a sufficient sample size for the health conditions of interest) or oversampling patients on the basis of the conditions of interest. Evaluation of individual physicians using small samples of patients is statistically inappropriate and a misuse of this indicator set.

We envision using this quality indicator system in several different ways. Performance on the measures could be used to assess the overall care delivered to vulnerable elders by a plan, medical group, or health system. Performance on measures for specific conditions or domains (such as prevention, diagnosis, and follow-up) could also be used to identify areas in need of improvement. Within the context of large groups, recognition of poor performance on specific indicators could provide the stimulus to intervene in order to improve the targeted care processes. Furthermore, the linkage of the literature summaries with the sets of indicators may serve as a useful educational tool.

These indicators synthesize the essential literature on important care for older adults and implement it in a practical manner. The literature summaries that follow (and those located on the ACP–ASIM Web site) link the clinical processes contained in the indicators to concise statements of the evidence supporting their use. Physicians can use this information to evaluate their own practices and modify them as new data emerge.

**APPENDIX**

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Acknowledgments: The authors thank Robert Brook, MD, for initiating this project and for guidance, inspiration, and foresight at every stage of this endeavor. Robin P. Hertz, PhD, senior director of outcomes research/population studies at Pfizer Pharmaceuticals, provided valuable advice and direction. Lisa Egbuonu-Davis, MD, vice president of global research/population studies at Pfizer Pharmaceuticals, provided valuable advice and direction. Lisa Egbuonu-Davis, MD, vice president of global research/population studies at Pfizer Pharmaceuticals, provided valuable advice and direction. Lisa Egbuonu-Davis, MD, vice president of global research/population studies at Pfizer Pharmaceuticals, provided valuable advice and direction. Lisa Egbuonu-Davis, MD, vice president of global research/population studies at Pfizer Pharmaceuticals, provided valuable advice and direction.

Grant Support: By a contract from Pfizer Inc. to RAND. Dr. Wenger was a Sorus Foundation Project on Death in America Faculty Scholar during this Project. Dr. Shekelle is a Senior Research Associate of the Veterans Affairs Health Services Research and Development Service.

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References