Quality Indicators for Dementia in Vulnerable Community-Dwelling and Hospitalized Elders

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Dementia is defined by acquired, progressive impairment in two or more cognitive areas (for example, frontal executive function, mood, or memory) that is severe enough to render a person dependent on others. Dementia is a leading cause of disability among older adult patients; Alzheimer disease is the most common etiology. The prevalence of Alzheimer disease is approximately 2% among persons 60 to 64 years of age, and the prevalence increases exponentially every 5 years thereafter, reaching 40% among persons older than 80 years of age (1, 2). The prevalence of the other common dementias, including vascular dementia, the combination of Alzheimer disease and vascular dementia, and dementia with Lewy bodies, ranges from 15% to 20% (3). The incidence of Alzheimer disease is approximately 266 000 cases per year (4). Because the older adult population will grow 50% over the next three decades, the need for dementia care will increase significantly (5).

Alzheimer disease and vascular dementia are contributory causes of death among 19% of elders older than 85 years of age, decreasing life expectancy by to 4 years (6). The mortality rate among patients with newly diagnosed Alzheimer disease is twice that seen in age-matched, nonaffected persons in the community (7). Dementia is the most common reason for placement of older adults in nursing facilities (8).

The advent of pharmacotherapy to forestall cognitive decline presents new opportunities to reduce disability during the course of Alzheimer disease and related dementias. This paper presents indicators to assess the quality of care for patients with dementia.

METHODS

The methods for developing these quality indicators, including literature review and expert panel consideration, are detailed in another paper in this issue (9). For dementia, the structured literature review identified 2277 titles, from which abstracts and articles relevant to this report were identified. On the basis of the literature and the authors’ expertise, 30 potential quality indicators were proposed. The search terms and results of the literature review can be accessed at www.acponline.org/sci-policy/.

RESULTS

Of the 30 potential quality indicators, 14 were judged to be valid by the expert panel process (see the quality indicators on pp 653-667), 3 were folded into other indicators, and 13 were not accepted (www.acponline.org/sci-policy/). The literature review that supports each of the indicators judged to be valid by the expert panel process is summarized below.

Quality Indicator 1

Cognitive and Functional Screening

IF a vulnerable elder is admitted to a hospital or is new to a physician practice, THEN multidimensional assessment of cognitive ability and assessment of functional status should be documented BECAUSE screening for dementia can lead to early detection and initiation of treatment that may delay further progression.

Supporting Evidence. We found no direct evidence that screening for dementia results in delayed progression of dementia; however, an indirect chain of evidence supports this indicator. First, one study demonstrated that dementia screening by physicians detected dementia not apparent to patients or caregivers (10). Family members had not recognized dementia symptoms in up to 53% of dementia cases detected by screening.

In addition, early treatment can delay the progression of dementia (see Quality Indicator 6). Because diagnosis is needed to initiate treatment, screening may ultimately delay progression of the disease. Five dementia guidelines advocate documentation of cognitive ability or assessment of functional status on admission to a nursing home, hospital, or physician practice (11–15).

Education level, cultural understanding of aging...
and memory loss, and language affect assessment of a person’s mental status. For example, the Mini-Mental State Examination is valid for use as a dementia screening instrument only in persons with at least 8 years of education in an industrialized country. Persons with lower educational levels who cannot perform well on this instrument may not warrant a diagnosis of dementia if they still function independently in all cognitive areas. Although the Spanish Mini-Mental State Examination has been validated, many other translated versions have not. Other instruments or interview protocols may be more appropriate for non–English-speaking and non–Spanish-speaking patients (16). Family members from cultures that do not use western disease models may not consider an elder’s memory loss or dependence on the family for instrumental activities of living worth reporting. Assessment for dementia should take educational and cultural factors into account by using a collateral historian who knows the patient well, if available (17–19).

Examples of instruments for assessment of cognition are the Mini-Mental State Examination (20), the Cognitive Abilities Screening Instrument (21), and the Blessed Mental Status Examination (22). For evaluation of functional status, available measures include the Katz Index of Independence in Activities of Daily Living, the Clinical Dementia Rating Scale (23), and the 10 Warning Signs of Alzheimer’s Disease (24).

Quality Indicators 2 and 3
Medication Review for Dementia Symptoms

IF a vulnerable elder presents with symptoms of dementia, THEN the physician should review the patient’s medication list for initiation of medications that might correspond chronologically to the onset of dementia symptoms.

IF a vulnerable elder presents with symptoms of dementia that correspond in time with the initiation of new medications, THEN the physician should discontinue or justify the necessity of continuing these medications

BECAUSE medications can increase physical or functional disability, hasten decline, or necessitate institutionalization.

Supporting Evidence. We found no direct evidence that reviewing or altering patient medications will improve cognitive impairment. However, one quantitative review of descriptive studies concluded that when reversible causes were identified and treated, up to 23% of patients experienced partial reversal of dementia symptoms and up to 10% experienced full reversal. Polypharmacy was among the most common reversible causes (25). Some patients with dementia who are referred to specialists have a potentially reversible structural, toxic, or metabolic condition, although the percentages of patients with reversible dementia varies widely in published studies (25–27).

A review of the deleterious effects of polypharmacy in elderly persons estimated that 10% of reversible dementias may be attributed to cognitive impairment from drug toxicity (28). In an uncontrolled study, reduction or elimination of treatment with psychoactive medications improved cognitive and functional status in 38 residents of a dementia unit (29).

Quality Indicator 4
Laboratory Testing

IF a vulnerable elder has newly diagnosed dementia, THEN serum levels of vitamin B$_{12}$ and thyroid-stimulating hormone should be measured BECAUSE metabolic or endocrine disorders may cause reversible dementia or worsen dementia of other etiologies.

Supporting Evidence. No studies have assessed the utility of laboratory testing as part of a dementia work-up. However, vitamin B$_{12}$ deficiency, hypothyroidism, electrolyte imbalance, renal insufficiency, hepatic failure, and infectious illness can cause cognitive impairment or worsen underlying cognitive impairment by causing a superimposed delirium (30). Weytingh and colleagues (25) reported that 16.1% of 168 patients with reversible cognitive impairment had evidence of metabolic derangement on laboratory studies. Another review of seven case series showed that 17% of patients with a diagnosis of dementia who were referred to specialists had a potentially reversible metabolic condition (including vitamin B$_{12}$ deficiency), and 1% to 4% had infectious causes (31). Despite the low proportion of reversible cases of dementia across the studies, the authors of the two reviews recommended these blood tests as part of the work-up for dementia. However, in two prospective studies, none of the patients treated at a memory clinic for reversible dementia due to hypothyroidism...
(32) or B12 deficiency (32, 33) experienced reversal. Eight dementia guidelines recommend routine laboratory evaluation as part of dementia work-up (12–14, 33–37).

Quality Indicator 5
Neuroimaging

IF a vulnerable elder has signs of dementia and focal neurologic findings that suggest an intracranial process, THEN he or she should be offered neuroimaging (brain computed tomography or magnetic resonance imaging) BECAUSE these studies aid in detection of reversible causes of dementia (by ruling out neoplasm, subdural hematoma, stroke, and normal-pressure hydrocephalus), hone diagnosis, and guide treatment.

Supporting Evidence. No studies have directly evaluated the utility of neuroimaging as part of the work-up for dementia. One abstract described a descriptive prospective study in which 12% of 210 demented patients had potentially treatable central nervous system lesions, but treatment of 4 of those patients did not improve cognition (38).

Neuroimaging for routine work-up of dementia is controversial; the cost of imaging must be weighed against the rarity of finding a potentially treatable brain lesion. A population-based study found that surgical brain lesions (such as normal-pressure hydrocephalus and subdural hematoma) do not present as dementia without focal neurologic symptoms and signs (39). Martin and colleagues (40) reviewed the medical records of 204 patients with dementia who had undergone computed tomography of the head and compared radiologic findings among those patients in light of clinical prediction rules proposed in two other articles. Bradshaw (41) and Dietch (42) and their associates predicted that computed tomography was more likely to reveal treatable abnormalities in patients with acute onset of dementia; focal neurologic signs; headache; and history of recent head trauma, seizure, or stroke. However, these clinical prediction rules led to misclassification rates of 24% to 61%. The majority of the misclassifications were negative computed tomograms in patients who met the clinical criteria for scanning. The sensitivity of using only two factors (headache and focal neurologic findings) was low (12.5%), but adding history of recent head trauma, seizure, or stroke increased specificity to 87.5% (40). No formal cost–benefit analyses of neuroimaging have been performed. Six published guidelines for dementia evaluation recommend structural neuroimaging as part of the routine work-up for dementia (12, 14, 36, 37, 43, 44).

Quality Indicator 6
Cholinesterase Inhibitors

IF a vulnerable elder has mild to moderate Alzheimer disease, THEN the treating physician should discuss treatment with a cholinesterase inhibitor with the patient and the primary caregiver (if available) BECAUSE treatment with cholinesterase inhibitors has been reported to delay cognitive decline and loss of instrumental activities of daily living, at least temporarily, and alleviate behavioral disturbances, which significantly decreases caregiver burden and delays institutionalization of the patient.

Supporting Evidence. Four double-blind, controlled, multicenter clinical trials of patients with possible and probable Alzheimer disease were identified in which treatment with a cholinesterase inhibitor was beneficial (45–48). Treatment with tacrine reduced the likelihood of nursing home placement compared with placebo-treated controls (odds ratios ≤ 0.37; all P < 0.01) in 30-week and 2-year open-label studies (45). However, other investigators suggested that this study may have suffered from selection bias in favor of healthier patients who were better able to tolerate high doses of tacrine (49). In another double-blind, placebo-controlled, multicenter study, a combination of tacrine and lecithin (phosphatidyl choline, the precursor to acetylcholine) reduced apathy, anxiety, disinhibition, and aberrant motor behavior (P < 0.01) (46).

A 15-week, double-blind, placebo-controlled, multicenter trial of the second-generation cholinesterase inhibitor donepezil in patients with mild to moderately severe Alzheimer disease found significant improvements in the Clinician’s Interview-Based Impression of Change Plus (with caregiver information), the Alzheimer’s Disease Assessment Scale–Cognitive (ADAS-Cog), and the Mini-Mental State Examination (P < 0.01) (47). Although the changes in mean scores on the ADAS-Cog and Mini-Mental State Examination were not clinically meaningful, the 0.3- to 0.4-unit differences between the treatment and placebo groups on the Clinician’s Interview-Based Impression of Change...
Plus were correlated with clinical improvements (47). The follow-up to that study reported continued benefit over 24 weeks in patients taking donepezil compared with placebo-treated controls (48). Only 5% of patients receiving donepezil were institutionalized over 6 months compared with 10% of placebo recipients matched by age and disease severity. On average, direct medical expenses in the two groups did not differ significantly (50). Three published guidelines support use of cholinesterase inhibitors for treatment of Alzheimer’s disease (11, 12, 14).

Use of cholinesterase inhibitors is limited by adverse effects and cost. Adverse effects include nausea, vomiting, diarrhea, anorexia, and fatigue. The frequency and severity of adverse effects differ among available agents, and individual patients may respond differently to different cholinesterase inhibitors.

Reducing the cost of treatment with cholinesterase inhibitors requires understanding when the drug is no longer effective in a given patient. No clinical trials are available to guide clinicians in how long to continue cholinesterase inhibition, but many geriatric psychiatrists and neurologists discontinue treatment if the patient continues to decline despite 3 months of treatment at the recommended therapeutic dose (51). “Non-responders” in clinical trials of cholinesterase inhibitors were defined as patients who experienced worsening of cognition or whose decline followed the same trajectory as that of patients taking placebo.

Quality Indicator 7
Caregiver Support and Patient Safety

IF a vulnerable elder with dementia has a caregiver (and, if capable, the patient assents), THEN the physician should discuss or refer the patient and caregiver for discussion about patient safety, provide education on how to deal with conflicts at home, and inform them about community resources for dementia BECAUSE disabled or inadequate caregiving poses a risk for exacerbation of cognitive, physical, and functional impairment in the patient.

Supporting Evidence. Caregivers are not likely to discuss the burden of caring for demented patients or ask for help unless the patient’s health care team raises these issues. However, an overburdened caregiver may directly harm the patient. In one study, 6% of caregivers admitted to both an overwhelming sense of burden and abuse of the demented patient (52).

Nine clinical trials reported significantly improved patient or caregiver outcomes when caregiver needs were assessed and education or counseling was provided. Educational interventions both delayed institutionalization and enhance caregivers’ quality of life and satisfaction with nursing care (53). Comprehensive support and counseling for spouse-caregivers delay nursing home placement of mildly and moderately demented patients with Alzheimer disease by 329 days (54). The relative risk for institutionalization among patients in the treatment group was 0.65 (95% CI, 0.45 to 0.94).

A third study showed that counseling by telephone assisted spouse-caregivers in feeling more competent and knowledgeable about Alzheimer disease and enabled them to make caregiving decisions with greater independence (55). Scores on the Zarit Burden Interview, which assesses caregiver burden, improved for caregivers who received serial, extended telephone contact over 8 weeks, whereas scores for caregivers who only had one informational phone contact worsened. Use of community support services increased in the group with extended contact (56). A more intensive caregiver education program, which provided 10 days of residential training for dementia caregivers, demonstrated marked differences in patient outcomes (57). At 39 months of follow-up, patients who were living at home with trained caregivers at the start of the study had higher adjusted rates of survival at home compared with controls (53% vs. 13%; \( P = 0.02 \)) and fewer total deaths (20% vs. 41%; \( P = 0.02 \)). Caregiver training did not affect institutionalized patients. The investigators calculated that caregiver training saved $5975 per patient in nursing home expenses over 39 months. Because delayed enrollment in caregiver training reduced the benefits accrued from the intervention, caregiver support and education should begin as soon as dementia is diagnosed.

Respite care also may benefit the caregiver and the patient. One pre- and post-intervention study on the effects of respite care on patients and caregivers observed improvements only in patient behavior (58). In another study, respite care reduced subjective caregiver burden and depression, but the effect lasted only as long as the respite period (59). Although the recurrence of burden and distress might seem likely to hasten institutionalization, even brief respite delayed institutionalization. Ed
ucation of caregivers about the importance of their own well-being may enhance the perceived benefit of respite care. One meta-analysis reported that support services for individual caregivers and respite programs may be more effective than support groups in relieving caregiver burden (60).

These interventions are recommended in four guidelines and two review articles on dementia (11, 13, 14, 33, 61, 62).

**Quality Indicator 8**

*Stroke Prophylaxis*

**If** a vulnerable elder with dementia has cerebrovascular disease, **then** he or she should be offered appropriate prophylaxis against stroke **because** comorbid cerebrovascular disease worsens cognitive impairment and increases mortality.

**Supporting Evidence.** No clinical trials have proved an additional benefit of adding prophylaxis against stroke to the medication regimen of a demented patient with risk factors for stroke, but vascular dementia or further central nervous system injury from a secondary cause should be prevented. A prospective study of 61 women with autopsy-confirmed Alzheimer disease showed an association between the presence of additional lacunar or larger, cortex-based strokes and more severe clinical symptoms of dementia (63). In another study, patients with cognitive impairment in later life also had hypertensive ischemic changes in white matter (64). Comorbid cerebrovascular disease increased the 7-year mortality rate among elderly demented women (relative risk, 1.8 [95% CI, 1.1 to 3.0]) (6). Prophylaxis against stroke includes pharmacotherapy, such as antiplatelet agents (aspirin or clopidogrel) or anticoagulation (warfarin), or, in some cases, carotid endarterectomy. Treatment of risk factors for stroke, such as hypertension or diabetes, should minimize cognitive impairment.

**Quality Indicators 9 and 10**

*Depression Screening and Treatment*

**If** a vulnerable elder has dementia, **then** he or she should be screened for depression during the initial evaluation **because** recognition and treatment of depression will improve symptoms of dementia and reduce suicide.

**If** a vulnerable elder with dementia has depression, **then** he or she should be treated for the depression **because** depression worsens the degree of cognitive and behavioral impairment and increases the risk for suicide.

**Supporting Evidence.** A review of the effect of treatment of depression on behavioral disturbances reported that improvement in depression decreases verbal agitation; physical aggression; and nonphysical, agitated aggression among patients with dementia ($P < 0.001$) (65). No other direct evidence was found for this indicator. Several descriptive studies provided indirect evidence of poorer outcomes for older adults with depression compared to those without depression. Community-dwelling, demented and nondemented elders who were depressed for 4 years were 1.55 times more likely than nondepressed persons to experience decline in physical performance (66). Nondemented older adults who were hospitalized had significantly higher mortality rates if they were depressed ($P < 0.05$) (66, 67). Depressed older patients require a significantly higher total number of days of inpatient care during the index admission and during the ensuing 5 months ($P < 0.05$).

Suicide occurs three times more frequently among elderly persons than in the general population, and dementia is a risk factor for suicide among elderly persons (68). Demented patients with suicidal thinking usually have associated symptoms of depression (69, 70) or continuing alcohol abuse (71). However, these and other risk factors for suicide may not be recognized. Seventy-five percent of elderly patients who committed suicide had contact with their primary care physician in the month before the suicide, but their suicidal intent was unrecognized or untreated (72). Dementia guidelines and one review support recognition and treatment of depression because of its impact on cognition and behavior (11, 34, 37, 61).

**Quality Indicator 11**

*Driving Privileges*

**If** a vulnerable elder has newly diagnosed dementia, **then** the diagnosing physician should advise the patient not to drive a motor vehicle or request that the Department of Motor Vehicles (or an equivalent agency) retest the patient’s ability to drive, or refer the patient to a drivers’ safety course that includes assess-
ment of driving ability (consistent with state laws) BECAUSE patients with dementia are at increased risk for motor vehicle accidents, which increases risk for disability and death in the patient and other motorists.

Supporting Evidence. Six studies have positively correlated dementia, even at mild stages, with hazardous driving and increased frequency of motor vehicle accidents (73–78). Three retrospective studies compared the driving records of demented patients with those of age-matched controls without dementia. In two of these studies, the number of accidents was higher among persons with even mild dementia (73, 78). In the third study, the rate of motor vehicle accidents among demented patients increased yearly to a maximum of 70% (74). The American Academy of Neurology’s practice parameter statement concludes that drivers with Alzheimer disease and a clinical dementia rating scale score of at least 1 pose significantly higher risks to driver safety (79). The three prospective, controlled studies that compared performance on a practical road test showed that up to 40% of patients with mild Alzheimer disease failed the test, whereas all nondemented older adult controls passed (75–77).

Three published dementia guidelines and one review support restriction or revocation of driving privileges for patients with dementia (12, 34, 61, 79). Laws on whether dementia is a reportable illness differ by state.

Quality Indicators 12, 13, and 14
Restraints

IF a vulnerable elder with dementia is to be physically restrained in the hospital, THEN the target behavioral disturbance or safety issue justifying use of the restraints must be identified to the consenting person (patient or legal guardian) and documented in the chart BECAUSE such identification will facilitate determination of alternate methods for prevention of the target disturbance and the extent to which the restraints will be used.

IF a vulnerable elder is physically restrained and the target behavioral disturbance requiring restraint is identified, THEN the health care team should include methods other than physical restraints in the care plan BECAUSE such measures will minimize the risk for adverse effects of physical restraints, including deterioration of cognitive function, falls, and complications from immobility.

IF a vulnerable elder is placed in physical restraints, THEN each of the following measures should be enacted:
1. Consistent release from the restraints at least every 2 hours;
2. Face-to-face reassessment by a physician or nurse at least every 4 hours and before renewal of the restraint order;
3. Observation at least every 15 minutes, and more frequently if indicated by the patient’s condition, while the patient is in restraints;
4. Interventions every 2 hours (or as indicated by patient’s condition or needs) related to nutrition, hydration, personal hygiene, toileting, and range of motion exercises

BECAUSE these measures will minimize the use of physical restraints and the risk for adverse effects.

Supporting Evidence. Suggested alternatives to physical restraints include 1) physiologic strategies to address hunger, thirst, incontinence, and inadequate visual or auditory perception; 2) psychosocial strategies to orient, calm, or redirect the patient; 3) furnishing visual reminders to use a call bell for assistance with transfers or toileting; 4) distraction with recreational programs or activities; 5) creating adequate and safe space to pace or wander; 6) increasing daytime stimulation for patients with the “sundowning syndrome” (increased confusion and agitation in the evening); 7) use of calming background music or reduction of extraneous noises; 8) use of psychotropic medication to treat depression, anxiety, or psychosis; 9) rehabilitation to enhance abilities to transfer and ambulate safely, and 10) provision of equipment for detecting and notifying staff of the patient’s attempts to stand up.

No direct evidence exists for these indicators. Monitoring patient falls as an outcome variable has not yielded any positive correlation between the interventions suggested and a decrease in the number of falls observed, although some studies show an increase in the number of falls when patients are restrained (80–84). The infrequency of patient falls reduces the reliability of this outcome measure.

These indicators are stated in several guidelines (85–87). One published nursing algorithm for use of restraints includes the condition that restraints should not
be applied if the patient has no potential for self-injury or injury to others (87).

The indicators apply to both nursing home residents and inpatients, but the ability to provide alternatives to use of physical restraints may differ according to setting, availability of space, and staffing (88). The Clinical Practice Guideline drawn up by the American Medical Directors Association and the American Health Care Association (89) applies specifically to nursing home care but does not differ significantly from other guidelines in recommending alternatives to physical restraints for behavioral control. Other federal regulations for nursing homes mandate that restrained patients be repositioned at least every 2 hours (90).

**DISCUSSION**

Of the 14 approved dementia quality indicators, 5 concern diagnosis or screening, 2 address treatment or management of dementia, and 7 pertain to comorbid diseases. Each of these indicators is based on direct evidence or a combination of indirect evidence and expert consensus. Implementation of these indicators will provide a measure of the quality of dementia care and identify areas of care that can be improved. In addition, these indicators may serve as a basis to compare the care provided by different health care delivery systems as well as changes in care over time.

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