

# Quality improvement in neurology

## Mild cognitive impairment quality measurement set

Norman L. Foster, MD, Mark W. Bondi, PhD, ABPP-CN, Rohit Das, MD, Mary Foss, Linda A. Hershey, MD, PhD, Steve Koh, MD, MPH, MBA, Rebecca Logan, PA-C, MPAS, Carol Poole, Joseph W. Shega, MD, Ajay Sood, MD, PhD, Niranjana Thothala, MD, MRCP(UK), MBA, Meredith Wicklund, MD, Melissa Yu, MD, Amy Bennett, JD, and David Wang, DO

**Correspondence**  
American Academy of  
Neurology  
quality@aan.com

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Mild cognitive impairment (MCI) is a syndrome increasingly recognized in older adults and has become a major focus of clinical care and research. MCI is used to describe acquired objective cognitive deficits that are insufficiently severe to affect most usual daily activities. A report of cognitive difficulty or change is insufficient to recognize MCI; objective measures documenting deficits are required. Maintenance of daily function distinguishes MCI from the dementia syndrome, yet it is particularly important because of its high risk for subsequent development of progressive dementia, particularly Alzheimer disease (AD) dementia. Patients with MCI may or may not recognize their impairments; consequently, concerns raised by friends or family and periodic cognitive health screening may be required to identify its presence. The syndrome can be further delineated as impairing a single or multiple cognitive domains and is often classified as either amnesic or nonamnesic.<sup>1</sup> Amnesic MCI in particular often represents a prodromal form of AD dementia, although it is important to acknowledge that reversion to cognitive normalcy also occurs with some frequency.<sup>2</sup>

MCI syndrome has many causes, making evaluation and management a clinical challenge.<sup>3</sup> Furthermore, many factors can contribute to cognitive deficits in patients with MCI. Depending upon the clinical context and with a detailed evaluation, it is often possible to identify neurologic disorders that account for some or all of a patient's cognitive deficits. The National Institute on Aging/Alzheimer's Association criteria use the classification of MCI due to AD, and assign the diagnosis with increasing likelihood if there is biomarker evidence of AD pathology.<sup>4</sup> Likewise, the American Heart Association/American Stroke Council has proposed criteria for vascular MCI<sup>5-7</sup> and the Movement Disorders Society workgroup has proposed criteria for MCI in Parkinson disease.<sup>8</sup> Despite the importance of these etiologic classifications, they only alter expectant management and do not predict whether an individual will develop progressive dementia. MCI generally corresponds to the term "mild neurocognitive disorder" used in the DSM-5.<sup>9</sup>

In 2018, the American Academy of Neurology Institute (AANI) updated its 2001 practice guideline on the prevalence, prognosis, and treatment of MCI.<sup>10</sup> This committee found the worldwide prevalence of MCI to be 6.7% for those aged 60–64 years, 8.4% for those aged 65–69 years, 10.17% for those aged 70–74 years, 14.8% for those aged 75–79 years, 25.2% for those aged 80–84 years, and 37.6% for those aged 85 years and older.<sup>10</sup> Given the high prevalence, it is important to monitor and confirm care is provided consistently with guideline recommendations or directly monitor patient outcomes through quality measurement.



From the Center for Alzheimer's Care, Imaging and Research, Department of Neurology (N.L.F.), University of Utah, Salt Lake City; Department of Psychiatry (M.W.B., S.K.), University of California San Diego, La Jolla; Veterans Affairs San Diego Healthcare System (M.W.B.), CA; Department of Neurology (R.D., R.L.), University of Texas Southwestern Medical Center, Dallas; Alzheimer's Association (M.F., C.P.), Chicago, IL; Department of Neurology (L.A.H.), University of Oklahoma Health Sciences Center, Oklahoma City; University of Central Florida College of Medicine (J.W.S.), Lake Nona; VITAS Healthcare (J.W.S.), Miami, FL; AMITA Health Neurosciences Institute (A.S.), Elk Grove Village, IL; Department of Medicine (N.T.), Good Samaritan Hospital, Vincennes, IN; Department of Neurology (M.W.), Barrow Neurological Institute, Phoenix, AZ; Alzheimer's Disease and Memory Disorders Clinic, Department of Neurology (M.Y.), Baylor College of Medicine, Houston, TX; American Academy of Neurology (A.B.), Minneapolis, MN; Neurology Department (D.W.), University of Illinois College of Medicine at Peoria; and OSF Saint Francis Medical Center Comprehensive Stroke Center (D.W.), Peoria, IL.

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## Glossary

AAN = American Academy of Neurology; AANI = American Academy of Neurology Institute; AD = Alzheimer disease; ADL = activities of daily living; CMS = Centers for Medicare and Medicaid Services; DSM-5 = *Diagnostic and Statistical Manual of Mental Disorders, 5th edition*; IADL = instrumental activities of daily living; MCI = mild cognitive impairment; MIPS = Merit-based Incentive Payment System; QSS = Quality and Safety Subcommittee.

The AANI's Quality and Safety Subcommittee (QSS) recommended a multidisciplinary stakeholder workgroup be seated to develop quality measures for MCI to drive quality improvement in practice. Despite common beliefs that exemplary care is provided, objective health care quality measures are needed to confirm care is being provided uniformly and consistent with guideline statements. The workgroup developed 6 quality measures meaningful to clinicians, patients, or care partners (table). Full measure specifications are available online at [aan.com/policy-and-guidelines/quality/quality-measures2/quality-measures/geriatric-neurology/](http://aan.com/policy-and-guidelines/quality/quality-measures2/quality-measures/geriatric-neurology/) and in appendix e-1 ([links.lww.com/WNL/A972](http://links.lww.com/WNL/A972)). There is no mandate to use all 6 measures in the set, and clinicians are encouraged to start quality improvement efforts small. Potentially, clinicians may find using 1 or 2 of these quality measures beneficial to ensure care is consistently provided and address disparities in care given. They are designed to capture information that is usually collected in the course of clinical care. The measures should be readily retrievable from documented notes in the electronic health record without further provider intervention.

## Opportunities for improvement

MCI is clinically important, but often not recognized, and if recognized may not be addressed.<sup>11,12</sup> Since cognition is the most sensitive indicator of brain function, and is cost-effectively assessed, this creates an enormous opportunity to improve neurologic care. Cognitive impairment is a dominant comorbidity influencing not only what care is recommended for that problem, but also how care for all other illnesses should be provided. Consequently, knowing the cognitive health status of high-risk patients, especially older patients and those with neurologic disease, has inherent clinical relevance. Treatment adherence may require care partners, written communication to reinforce verbal instructions, and selection of medications to avoid those with known cognitive side effects.<sup>13</sup>

A key requisite for a quality measure is its potential beneficial effect on patient outcomes. Clinician performance on the measure must be identified as not yet ideal with the potential

for improvement. The workgroup recognizes that these measures do not capture all aspects of providing high-quality care for patients with MCI. The workgroup proposed quality care concepts addressing causation, cognitive and functional evaluation, diagnostic imaging and testing, disclosure of diagnosis, medications, neuropsychological testing, management, legal planning, care partner concerns, the role of exercise, enrollment in clinical trials, quality of life, and ongoing treatment and follow-up. Current AANI practice guidelines and quality measures already address some aspects of MCI care and have established a foundation upon which measures were able to be built. The workgroup recognized the role of the Centers for Medicare and Medicaid Services' (CMS) Merit-based Incentive Payment System (MIPS) in encouraging the adoption of quality measures through value-based payments and the National Quality Forum standards for endorsement of such measures. Most importantly, broad professional and lay representation was sought on the workgroup and it strove to construct meaningful and practical measures for clinicians that could be implemented in time-constrained practices.

The workgroup chose to prioritize periodic cognitive health assessment, functional status assessment, diagnosis disclosure and education, assessment and treatment of contributing factors, avoidance of anticholinergic medications, and education to care partners for this first round of quality measures for patients with MCI. Concepts on advance care planning, quality of life, and abuse and violence were not considered given measures on these topics already exist. Quality measures outlining the requirements for a cognitive evaluation sufficient to determine the causes of MCI are urgently needed, but the workgroup decided they were outside the scope of this current measurement set. The approach to a diagnostic cognitive evaluation can be complex and depends upon the medical, psychiatric, and social context of the patient and the medical setting. Recognizing cognitive impairment and describing the patient's strengths and weaknesses are the necessary first steps to achieving an etiologic understanding to guide treatment. A summit convened by the National Academy of Neuropsychology with representation of the AANI proposed guidelines for early identification of MCI syndrome in primary care, emergency department, and medical settings, but did not undertake an algorithm to determine etiology.<sup>14</sup> A diagnostic evaluation for MCI shares most of the components in evaluating dementia as described in the AANI guideline for etiologic diagnosis of dementia, currently under development.

### + Supplemental Data

Full measurement set

[NPub.org/smiqdb](http://NPub.org/smiqdb)

## Table Mild cognitive impairment (MCI) quality measurement set

### Annual cognitive health assessment for patients 65 years and older

Numerator: Patients who had cognition assessed\*  
Denominator: Patients aged 65 and older

Patients removed from the denominator if they did not meet the numerator when they declined a cognitive health assessment on the date of the encounter, they were not able to participate in a cognitive health assessment and no knowledgeable informant was available, or they previously had a cognitive assessment in the measurement period.

### Cognitive and functional assessment for patients with MCI or memory loss

This measure has 3 components:

A. Numerator: Patients who had cognition assessed\*  
Denominator: Patients diagnosed with memory loss or MCI

Patients removed from the denominator if they did not meet the numerator when they declined a cognitive health assessment on the date of the encounter or they previously had a cognitive assessment in the measurement period.

B. Numerator: Patients who had an assessment of functional status\* involving a knowledgeable informant  
Denominator: Patients diagnosed with memory loss or MCI

Patients removed from the denominator if they did not meet the numerator when the knowledgeable informant declined to complete a functional status assessment.

C. Numerator: Patients who had both a cognition and functional status assessment\*  
Denominator: Patients diagnosed with memory loss or MCI

### MCI diagnosis disclosed and counseled on treatment options

Numerator: Patients informed of their MCI diagnosis, educated on cognitive prognosis, and counseled on treatment plan options\*  
Denominator: Patients diagnosed with MCI

Patients removed from the denominator if they did not meet the numerator when they declined information on their diagnosis, declined information on education on cognitive prognosis, declined counseling on treatment plan options, or were actively suicidal or expressing self-harm statements.

### Assessment and treatment of factors contributing to MCI

Numerator: Patients who have had treatment for contributing behavioral and psychiatric symptoms; hearing and vision deficits; sleep disturbances; neurologic diseases; or medical illnesses following a comprehensive neuropsychological assessment to determine contributing factors\*  
Denominator: Patients diagnosed with MCI

Patients removed from the denominator if they did not meet the numerator when they declined treatment or were not adherent to treatment for contributing factors.

### Avoidance of anticholinergic medications for patients with MCI

This is an inverse measure where a lower score indicates better quality.

Numerator: Patients who were taking anticholinergic medications\*  
Denominator: Patients diagnosed with MCI

Patients removed from the denominator if they did not meet the numerator when they were at end of life or admitted to hospice care or receiving cancer chemotherapy.

### Education provided to care partners of patients with MCI

Numerator: Care partner(s) of patients with MCI provided with education\* on 1. MCI diagnosis; 2. Cognitive prognosis; 3. Warning signs of disease progression to dementia; and 4. Treatment plan options  
Denominator: Patients diagnosed with MCI

Patients removed from the denominator if they did not meet the numerator when they declined to identify a care partner, a care partner could not be identified, or care partners declined any education.

\*Refer to appendix e-1 ([links.lww.com/WNL/A972](https://links.lww.com/WNL/A972)) for further definitions.

## Annual cognitive health assessment for patients 65 years and older

The routine assessment of cognitive health in high-risk individuals provides an opportunity to improve the recognition of MCI and allows earlier intervention. Many neurologic disorders put patients at risk of cognitive impairment, as recognized in practice guidelines and quality measures recommending cognitive screening following stroke, in Parkinson disease, in multiple sclerosis, and in patients receiving neurologic hospital and emergency care.<sup>15–18</sup> Adults over 65 also are at high risk because of their age, as recognized in the requirement for cognitive health assessments during preventive Medicare Annual Wellness Visits.<sup>19</sup> Patients over age 65 with neurologic illnesses thus are at even greater risk.

Cognitive health screening also alters outcomes. When the Mini-Cog was administered routinely to all neurology patients aged  $\geq 70$  without a history of a cognitive disorder in one practice, 37.4% were found to be impaired and these resulted in a 10-fold increase in follow-up cognitive assessments and a 3-fold increase in a diagnosis of cognitive impairment or dementia.<sup>20</sup> The proportion of patients with reports of cognitive difficulty or change did not differ between those who screened positive and negative. Physicians fail to recognize about 50% of patients in their practice with significant cognitive deficits, missing an opportunity to offer appropriate evaluation and treatment.<sup>21</sup> Depending solely on a complaint is insufficient because patients may not recognize or report worsening memory problems to their physicians.<sup>11</sup> Although there is

conflicting evidence on the benefits of screening for dementia in older adults, there is growing support for the benefits of assessment of cognitive health in patients over the age of 65.<sup>12,22</sup> An Advisory Council for Alzheimer's Research, Care, and Services convened to advise the Department of Health and Human Services after the passage of the National Alzheimer's Project Act of 2011 has recommended identifying early stages of AD including MCI as a national priority.<sup>23</sup> Documenting impaired cognitive health in a shared problem list in the patient's medical record can be invaluable in alerting other clinicians providing a patient's care and avoiding mismanagement.

### Cognitive and functional assessment for patients with MCI or memory loss

Assessing cognition and function are essential for distinguishing MCI from insignificant cognitive complaints on the one hand and from dementia syndrome on the other.<sup>9,10</sup> This distinction is relevant both during an initial evaluation and during follow-up visits. Objective measures documented in the medical record allow a more accurate assessment of change over time and improve communication of severity and possible outcomes with other members of the patient's care team. Too often clinicians will assume a patient has returned to usual function after an acute illness, when a prior objective measure could provide better evidence for this judgment. Marshall et al.<sup>24</sup> noted, "IADL [instrumental activities of daily living] impairment leads to early loss of independence and the ability to be an active member of society, while shifting many daily responsibilities to care partners and increasing their burden." Assessing for IADL and activities of daily living (ADL) impairment in patients with MCI on a routine basis will enable clinicians to identify deficits and offer treatment solutions earlier. It is anticipated that regular IADL and ADL assessment will improve rates of interventions and more precisely address daily problems patients and their families confront.

### MCI diagnosis disclosed and counseled on treatment options

Patients with MCI need to know about their condition so they can take steps to avoid exploitation, plan for their care, and monitor their condition. Clinicians often avoid discussions with patients and their families about the risk of MCI evolving into dementia.<sup>10,25,26</sup> This has led to the Alzheimer's Society's Right to Know Campaign.<sup>27</sup> Fewer than 50% of patients with AD report being told their diagnosis, and only slightly over 50% of care partners.<sup>28</sup> Knowing one's diagnosis early is important for patients' safety and future planning, tracking, and follow-up, and to help identify candidates for clinical trials.<sup>29,30</sup>

### Assessment and treatment of factors contributing to MCI

The estimates of patients who have reversible forms of MCI vary.<sup>31–33</sup> Hearing and visual loss may impair performance on cognitive testing or affect communication leading to apparent or symptomatic MCI. A variety of medical illnesses including hepatic and renal failure impair cognition. Depression, sleep disturbance, medication side effects, and a variety of

psychiatric illnesses impair attention and concentration, leading to memory deficits and impaired judgment. Whether these factors explain or simply contribute to the symptoms of MCI, they may be easily overlooked and warrant treatment.

### Avoidance of anticholinergic medications for patients with MCI

It is important to take a careful medication history in patients with symptoms and signs of MCI. Many medications potentially have adverse cognitive effects. Older adults, and particularly those with cognitive impairment, are particularly susceptible to these side effects. The American Geriatric Society has developed a process that identifies, and frequently updates through consensus, a list of medications that interfere with memory and should be avoided, called the Beers list.<sup>9</sup> The data are particularly compelling that many older adults may have memory problems due solely to anticholinergic drugs.<sup>34,35</sup> Furthermore, anticholinergic drug use is widespread in older adults.<sup>36</sup> In a 6-year longitudinal study of 1,652 African American patients, 53% used a possible anticholinergic medication.<sup>34</sup> Thus particular attention is justified in focusing on the use of this class of medications in patients with MCI.

### Education provided to care partners of patients with MCI

Respect for the autonomy of individuals with cognitive impairment has led medical ethicists to conclude that education, support, and access to services should be offered to both patients and their care partners at the time of diagnosis.<sup>37</sup> They found involving family members or friends identified by the patient with memory loss promoted the autonomy and well-being of both.<sup>37</sup> This same ethics workgroup also found ample evidence that people with dementia are often simply told to "return in 1 year."<sup>37</sup> It is notable that in MCI, concerned family and friends may not need to be "caregivers," but still play an important role in supervision and support as "care partners." Care partners of individuals with MCI have a need for increased support services, particularly for social interactions, at levels similar care partners of patients with AD.<sup>38</sup> Savla et al.<sup>39</sup> state: "The results also highlight the importance of MCI-related education and support programs for care dyads to strengthen concordance, which is likely an important underpinning for effective coping as the illness progresses."

The workgroup found the evidence for these gaps in care compelling and centered their measure development efforts around these well-documented opportunities to lessen these gaps and improve care.

### Methods

Details of the AANI's full measure development process are available online.<sup>40</sup> The workgroup included physicians, a physician assistant, neuropsychologist, patient, care partner, and patient advocacy representatives.

With the help of a medical librarian, the workgroup initiated a comprehensive search to identify published guidelines, measures, and consensus recommendations in the National Guidelines Clearinghouse, the National Quality Measures Clearinghouse, PubMed, MEDLINE, EMBASE, and the Cochrane Library for MCI. The search identified 1,932 potential articles from 2013 to project launch in late 2017. The workgroup winnowed results to 227 articles of interest and of these 7 guidelines and 32 systematic reviews or meta-analyses were identified.

Following review of literature results, the workgroup proposed 27 measure concepts. The workgroup members ranked the 27 concepts in importance of development. Workgroup members were encouraged to rank measures that were meaningful to patients and clinicians, feasible to collect, and supported by available evidence. Following review of rankings, 8 concepts were excluded from further development. Those concepts were offering clinical trial participation, exercise, legal planning, quality of life, and components of follow-up care and surveillance. In addition, 6 related concepts on causation or etiology were bundled into 1 concept and 3 related concepts on objective assessment were bundled into another single concept. The workgroup rated proposed concepts for further development based on the following criteria: effect on improving care, feasibility to collect data, and demonstrated link of interventions to improved patient outcomes. Four concepts were removed from further development following review of workgroup ratings: counseling regarding supplements, acetylcholinesterase inhibitors or memantine counseling, and care planning visits.

Six concepts advanced for workgroup discussions. Following these discussions, these 6 concepts were developed into draft measurement specifications. Each measure concept was voted on individually, confirming consensus to move forward with development of detailed measure specifications and public comment.

A 21-day public comment period was held. Seventy-four individuals provided comments. When asked “The measurement set is important to me, my patients, my organization or healthcare system,” 47 individuals (63.5%) responded they agree and 22 individuals (29.7%) responded they strongly agree out of the 74 respondents. When asked “The measurement set is important for improving the quality of care,” 37 individuals (50.7%) responded they agree and 33 individuals (45.2%) responded they strongly agree out of 73 respondents. When asked “The wording of the measures is clear,” 49 individuals (68.1%) agreed and 12 individuals (16.7%) strongly agreed out of 72 respondents. When asked “Information required for these measures is currently collected by healthcare professionals in your organization,” 33 (47.1%) responded they agree information is collected and 26 (37.1%) responded some information is collected. Consequently, there was strong agreement that

the proposed measurement set was important and feasible to implement.

Following review of this information as well as the individual comments on each measure concept, the workgroup met to discuss advancement of the measure concepts. The workgroup developed responses to each comment received and agreed to appropriate modifications of the 6 concept measure specifications based on these external comments. The workgroup, AANI’s QSS, Practice Committee, and Board of Directors subsequently approved the measurement set following these refinements.

## Results

The workgroup approved 6 measures that reflected an opportunity to improve the care of patients with MCI (table). These measures do not encompass all components that are characteristic of high-quality care, but represent practical steps to overcome gaps in detection, evaluation, and treatment that evidence shows occur too often. The workgroup believes that focusing on these measures will provide the highest value at the present time. As clinicians gain experience with these measures, further refinement and more patient-centered outcomes will become achievable. Full measurement specifications are available online at [aan.com/practice/quality-measures/](http://aan.com/practice/quality-measures/) and in appendix e-1 ([links.lww.com/WNL/A972](http://links.lww.com/WNL/A972)).

Based upon literature review, guideline statements, and filtered through the diverse perspectives of stakeholders and the clinical experience of workgroup members, 5 process measures and 1 intermediate outcome measure developed to reduce the number of anticholinergic medications were created. The first measure recommends an annual assessment of cognitive health in all patients 65 years and older. The broad application of this specific measure to the entire population of patients seen in neurologic practice is fundamental to improve the recognition of MCI. This measure is consistent with requirement of cognitive health assessment as part of the preventive Medicare Annual Wellness Visit relevant to all patients 65 and older and the recommendations of the Alzheimer’s Association to use an objective measure of cognition.<sup>29,30</sup> All patients with neurologic diseases of the CNS are at high risk for cognitive impairment and so it could be argued that the measure should not be limited to neurology patients in a specific age group. However, existing American Academy of Neurology (AAN) practice guidelines and quality measures address this risk for specific neurologic diseases. The measure broadens the periodic assessment of cognitive health to all patients 65 and over, because age itself is a significant risk factor for cognitive decline and MCI is increasingly prevalent with older age. Patients may not complain about memory problems or recognize evolving cognitive deficits, thus periodically and routinely assessing cognitive health with a standardized measure is necessary. Periodic assessments with objective assessments should be documented in medical

records over time to allow change in cognition to be recognized and addressed early. The purpose of assessing cognitive health is not limited to identifying disease. Cognitive impairment is a dominant comorbidity, affecting not only what treatment is appropriate, but also what treatment should be avoided and how care is provided. For example, a patient with cognitive deficits may need both verbal and written instructions, and involvement of a care partner for adherence to a treatment plan. It is not sufficient to wait for a voiced complaint to objectively assess cognitive health. As a practical matter, patients may not recognize a memory problem and even when they do they often do not report it to their physician. Furthermore, busy neurologic visits often do not provide an opportunity to elicit a cognitive complaint from family members or others who may have recognized a problem. The US Preventative Services Task Force in 2014 concluded that current evidence was insufficient to assess the balance of benefits and harms of screening for cognitive impairment.<sup>41</sup> However, these recommendations applied solely upon universal screening of community-dwelling adults in the general primary care population, not high-risk patients with neurologic problems. In such patients, being able to identify a change from an earlier assessment when a complaint is voiced later or detecting medication side effects are also valuable.

Several recommended objective measures of cognition that clinicians can use depending on familiarity and clinical context are listed. Tools that provide objective, quantifiable metrics are essential for high-quality care, because they provide a standardized way to monitor change over time and to enhance communication with other health care clinicians. Some require 2 minutes or less, others 12–15 minutes. These are intended as screening assessments only and are not sufficient for diagnosis alone. When there is ample evidence for concern, a more comprehensive neuropsychological assessment is appropriate, given that cognitive screening measurement strategies are limited by generally low sensitivity and specificity rates, whereas gold standard neuropsychological test batteries are more sensitive and specific.<sup>42–44</sup> Measurement of cognitive health assessments for patients aged 65 and over was chosen for both scientific reasons and practical reasons. Assessing cognitive health status is appropriate in patients with neurologic illness at any age; an assessment of mental status is an important part of any comprehensive neurologic examination. The purpose of an annual cognitive health assessment is to identify impairment early while at the same time a sufficient prevalence of impairment is needed to justify the required effort. The prevalence of MCI and other cognitive problems increases rapidly with increasing age. For those aged 65–69, the prevalence of MCI is 8.4% (it is undoubtedly higher in patients seeing neurologist care).<sup>10</sup> When added to the prevalence of dementia in this age group of 8.6%, an actionable result will be sufficiently common to be worthwhile.<sup>45</sup> Age 65 and over was also chosen for practical reasons. Most individuals this age qualify to receive at no out-of-pocket cost a Medicare Annual Wellness Visit, which

has assessment of cognition as a required component. Primary care providers usually conduct these visits, but this measure can be met if a cognitive assessment was performed and documented in the measurement period, even if it is from a wellness visit, thus saving effort.

The remaining quality measures are intended to apply to patients who already have a diagnosis of MCI. The second quality measure requires periodic assessment of both cognition and function in patients with MCI and memory loss. It thus has 2 components: the first requires use of an objective cognitive tool; the second requires involvement of a knowledgeable informant to rate functional status. Both components are essential for the recognition of MCI and throughout the course of care. Irrespective of level of complaint, either too little impairment or deficits too great exclude MCI. Periodic reassessment of both cognition and function are necessary because MCI often is not static. MCI is potentially reversible and epidemiologic studies show that classification can fluctuate, often due to external factors and education.<sup>46</sup> Symptoms in MCI also can progress, and MCI is a significant risk factor for later development of progressive dementia.<sup>10</sup> Consequently, objective worsening in metrics of function and cognition assessed periodically have high diagnostic and treatment relevance. The same objective cognitive measures as used for cognitive health assessment are listed, but in patients with MCI with known deficits, more detailed testing and neuropsychological batteries are more relevant.

The second component of this measure that requires information about daily function in a patient with MCI from a knowledgeable informant led to considerable discussion in the workgroup. Many patients arrive in clinic unaccompanied. Identifying and contacting a knowledgeable informant can be burdensome. This works best if arrangement is made for a knowledgeable informant (such as a family member or friend) to accompany a patient with MCI to clinic visits. Despite the challenges to scheduling and patient flow, the workgroup concluded that a knowledgeable informant for a patient with MCI is essential for high-quality care. With assent of the patient, such an individual can become a partner in implementing a care plan and help avoid poor treatment adherence and no-shows, making the extra effort worthwhile overall by improved practice efficiency and effectiveness. For patients with no social support, a home visit may be necessary to assure patient safety in the presence of substantial and objective cognitive deficits.

The third quality measure expects disclosure of diagnosis, prognosis, and counseling on treatment options. Although not required, the presence of a care partner during this discussion can be very helpful to share with care planning and provide support after disclosure. Although evidence supporting this discussion does not happen often, there was little disagreement among the workgroup that such a discussion is characteristic of high-quality care.<sup>30</sup> When MCI is due to a progressive dementing disease, a discussion of prognosis and

treatment can involve the patient in planning and treatment choices before disease progression limits competence. Although not listed as a quality measure here, the recommended discussion could reasonably lead to a patient-centered outcome of advance care planning, avoiding crises in care and developing a care team to support the patient. Clinicians can use procedure codes for advance care planning to facilitate and obtain reimbursement for these discussions.

The fourth quality measure captures some essential components of the evaluation patients with MCI need. Unlike a cognitive health assessment, a complete cognitive evaluation intended to determine the cause of cognitive complaints is complex and heavily dependent upon the clinical context. For example, a patient with MCI and a family history suggesting autosomal dominant pattern of inheritance of a young-onset dementing disease warrants an evaluation much different from a patient with MCI and a history of traumatic brain injury or autoimmune disease. The workgroup thus decided to defer developing measures designed to assess the quality and completeness of a cognitive evaluation. The measure selected instead focused on the common features that all cognitive assessments must consider—identification and treatment of factors that potentially are contributing to MCI symptoms. Addressing these factors will maximize the patient's abilities and reduce unnecessary burden, irrespective of the cause of MCI syndrome. This quality measure is equally relevant to treatment of cognitive complaints less than MCI and when deficits are more profound. This limited component of an assessment is also complex, and thus includes a considerable list of factors to be considered. Nevertheless, the workgroup believed there was great value in a checklist to help assure possible contributing factors were addressed and not overlooked.

The use of anticholinergic medications has sufficient importance to be identified as a distinct and separate quality measure. This is not a process measure, but considered an intermediate outcome, with the intended ultimate outcome of improved cognitive abilities. The adverse effects of anticholinergic medications on cognition are well-documented (in fact, anticholinergic drugs have been used in the past for their amnesic properties during childbirth and as an experimental model of AD) and their use in high-risk patients is very common.<sup>13</sup> Research also indicates clinicians often do not sufficiently consider their use in patients with cognitive complaints—there is considerable potential for practice improvement.<sup>34–36</sup> There was considerable workgroup discussion about this measure. There are appropriate short-term uses of these drugs in patients with MCI, such as part of a preoperative drug regimen. Measure users should recognize that elimination of these sometimes-useful drugs is not the goal. Instead, thoughtful consideration should lead to their decreased use in patients with MCI. It was recognized that other medications also can contribute to memory loss and could have been added. The workgroup believed that at present the evidence was most compelling for the need to focus attention on anticholinergic drugs.

The final selected measure consists of educating family members and patient-selected care partners about MCI. Since this measure requires involvement of a person other than the patient, it has the same challenge to usual clinic flow as our second selected quality measure that requires a knowledgeable informant. Although there are some distinctions between a knowledgeable informant (who only provides and does not receive information) and a care partner (who needs information to help implement treatment and provide patient support), in practice the same person usually plays both roles. Having both patient and care partner present during clinic visits facilitates achieving the goals of this concept. This measure recognizes that patients with memory loss may not recognize or report significant changes in cognition or function and that they may benefit from monitoring. Although technological developments may make remote monitoring possible, clinic visits alone are inadequate, and clinicians still depend upon care partners to provide relevant information. Care partners knowledgeable through health education help us provide high-quality care.

As noted above, it is impossible to develop all measures that are relevant to the quality of care for MCI. The workgroup noted that there was opportunity to support use of existing measures already developed to address some of the proposed concepts rather than develop new measures specific to MCI. The workgroup recommends use of the following measures for this population to supplement the above MCI-specific measures developed by the workgroup:

- CMS advance care planning for patients 65 years and older
- AAN advance care planning for patients 18 years and older with a primary neurologic disorder diagnosis
- CMS maltreatment screening
- AAN Axon Registry quality of life measures

## Discussion

The AANI hopes these measures will be meaningful for quality improvement efforts for patients with MCI. Clinicians are encouraged to start small, initially identifying 1 or 2 measures to focus on. For example, a 5-neurologist practice may implement the Avoidance of Anticholinergic Medication measure. This is an inverse measure where lower performance is indicative of better quality. During the group's initial assessment, it is determined that average performance on the measure is 24%, with 2 outliers: a neurologist with a performance rate of 47% and another with a performance rate of 11%. After discussing internally, it is found that medication reconciliation practices vary. The team restructures its medication reconciliation practices, resulting in more uniform performance rates. Further progress is made by educating referring primary care physicians on anticholinergic medication risks and implementation of education by medical assistants following medication reconciliation.

These quality measures are one tool to improving patient care. These measures will be reviewed at least triennially for updates. Measures may be retired or updated based on advances in evidence, feasibility concerns, or changes in treatment gaps. As treatment gaps are overcome, focus can shift to other opportunities for improvement. Quality measures may also be used for accountability programs such as MIPS after appropriate testing confirms reliability and validity.

MCI increasingly is being recognized as an important public health problem. Neurologists and other clinicians have an important role to play in recognizing, evaluating, and treating MCI. There is no mandate to use any or all of these measures in care. The measure use is voluntary and users are encouraged to share their successes in implementing these measures to improve care with peers to drive change in the field. The 6 quality measures provide a guide to clinician understanding of patients with MCI and to overcoming gaps in current practice.

### Author contributions

Dr. Foster contributed to concept and design, acquisition of data, analysis and/or interpretation of data, drafting/ revising the manuscript, critical revisions of the manuscript for important intellectual content, and supervision including responsibility for conduct and final approval. Dr. Bondi contributed to concept and design, acquisition of data, analysis and/or interpretation of data, and drafting/ revising the manuscript. Dr. Das contributed to acquisition of data, analysis and/or interpretation of data, drafting/ revising the manuscript, and critical revisions of the manuscript for important intellectual content. M. Foss contributed to concept and design, acquisition of data, analysis and/or interpretation of data, and drafting/ revising the manuscript. Dr. Hershey contributed to concept and design, acquisition of data, analysis and/or interpretation of data, and drafting/ revising the manuscript. Dr. Koh contributed to concept and design, acquisition of data, analysis and/or interpretation of data, and drafting/ revising the manuscript. R. Logan contributed to concept and design, acquisition of data, analysis and/or interpretation of data, and drafting/ revising the manuscript. Poole contributed to concept and design, acquisition of data, analysis and/or interpretation of data, and drafting/ revising the manuscript. Dr. Shega contributed to concept and design, acquisition of data, analysis and/or interpretation of data, and drafting/ revising the manuscript. Dr. Sood contributed to concept and design, acquisition of data, analysis and/or interpretation of data, and drafting/ revising the manuscript. Dr. Thothala contributed to concept and design, acquisition of data, analysis and/or interpretation of data, and drafting/ revising the manuscript. Dr. Wicklund contributed to concept and design, acquisition of data, analysis and/or interpretation of data, and drafting/ revising the manuscript. Dr. Yu contributed to concept and design, acquisition of data, analysis and/or interpretation of data, and drafting/ revising the manuscript. Bennett

contributed to concept and design, acquisition of data, analysis and/or interpretation of data, drafting/ revising the manuscript, critical revisions of the manuscript for important intellectual content, and supervision including responsibility for conduct and final approval. Dr. Wang contributed to concept and design, acquisition of data, analysis and/or interpretation of data, drafting/ revising the manuscript, critical revisions of the manuscript for important intellectual content, and supervision including responsibility for conduct and final approval.

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